Medication-related harm due to non-adherence may explain the relationship between polypharmacy and mortality

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Introduction

Strong evidence exists for a relationship between polypharmacy and mortality[1], independent of comorbidity. The mechanisms underlying this relationship are unclear. Medication-related harm (MRH) may occur due to non-adherence or adverse drug reactions. We sought to determine if MRH due to non-adherence or adverse drug reactions may explain the association between polypharmacy and mortality.

Methods

The PRIME study recruited 1280 older adults at hospital discharge from 5 hospitals in England between 2013 to 2015[2]. Patients were followed up in the community for 8-weeks by senior pharmacists to identify MRH using data from hospital readmissions, GP records and patient interviews. Mortality data at 12 months post-discharge were obtained from hospital records. Non-adherence was determined using a modified version of a validated questionnaire[3]. Adverse drug reactions were assessed using the Naranjo algorithm[4]. Adjusted logistic regression models were used to investigate the relationship between (1) number of medicines and MRH, (2) MRH and mortality.

Results

1116 out of 1280 patients completed follow-up (median age 82 years, range 65-103 years, 58% female). Patients were discharged with a median of 9 medicines (range 0-27). A higher number of medicines was strongly associated with MRH due to non-adherence ($p<0.01$) and adverse drug reactions ($p<0.001$). In multivariable analysis, MRH due to non-adherence was associated with one-year all-cause mortality (OR 1.80, 95% CI 1.08-2.99, $p=0.02$), however MRH due to ADR was not (OR 1.20, 95% CI 0.86-1.68, $p=0.28$).

Key Conclusions

Harm from non-adherence to medications may explain the relationship between polypharmacy and mortality.

References

[1] Leelakanok N, Holcombe AL, Lund BC, Gu X, Schweizer ML. Association between polypharmacy and death: A systematic review and meta-analysis. J Am Pharm Assoc 2017;57:729–738.

[2] Stevenson J, Parekh N, Ali K, Timeyin J, Bremner S, Van Der Cammen T, et al. Protocol for a Prospective (P) study to develop a model to stratify the risk (RI) of medication (M) related harm in hospitalized elderly (E) patients in the UK (The PRIME study). BMC Geriatr 2016;16:22. doi:10.1186/s12877-016-0191-8.

[3] Morisky DE, Green LW, Levine DM. Concurrent and predictive validity of a self-reported measure of medication adherence. Med Care 1986;24:67–74.

[4] Naranjo CA, Busto U, Sellers EM, Sandor P, Ruiz I, Roberts EA, et al. A method for estimating the probability of adverse drug reactions. Clin Pharmacol Ther 1981;30:239–45.